Notice of Allowability	Application No.	Applicant(s)	
	09/765,495	ARDEN, WILLIAM A.	
	Examiner	Art Unit	
	Toan N. Pham	2632	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *after final amendment filed on 9/01/05*.

2. ☒ The allowed claim(s) is/are *13-31*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Allowable Subject Matter

Claims 13-31 are allowed.

The following is an examiner's statement of reasons for allowance: The present invention is directed to providing a communication on power lines transmitting power at a power line frequency. Each independent claim identifies the uniquely distinct features:

Regarding claim 13: "selecting a transmission frequency for the signal; setting a voltage controlled oscillator to a preset frequency determined by the transmission frequency; dividing the oscillator output by the transmission frequency to derive an internal reference signal; comparing the phase of the internal reference signal to the phase of the power line carrier and using the changes in phase angle ms a feedback signal in a frequency lock loop for maintaining the oscillator at the transmission frequency; and transmitting a signal on the power line using an output stage driven at the transmission frequency".

Regarding claim 15: "selecting a mark frequency and a space frequency for the "1"s and "0"s of the data represented by the signal; starting a voltage controlled oscillator at a preset frequency determined by whether the mark frequency or the space frequency is being transmitted; dividing the oscillator output by either the mark frequency or the space frequency, depending upon which is being transmitted, to provide an internal reference signal; and comparing the phase of the internal reference signal to the phase of the power line carrier and providing the changes in phase as a

feedback signal in a frequency lock feedback loop to control the frequency of the oscillators".

Regarding claim 16: A transmitter comprising "a bit clock; a data shifter and packet generator for receiving data for transmission and converting it into packets containing a plurality of data bytes transmitted in response to the output of a bit clock; an A/D converter coupled to receive a signal from the power line at the power line frequency, the A/D converter coupled for delivering an output signal; a power line frequency tracker circuit coupled to receive an output signal from the A/D converter and packets from the data shifter and packet generator, the tracker circuit comprising an oscillator circuit constructed and arranged for operating at a mark frequency derived from the power line carrier for "1"s and at a space frequency derived from the power line carrier for "0"s the oscillator circuit operating as a phase lock loop circuit comparing the phase difference between a reference signal generated in the tracker circuit and the power line frequency and generating an output signal containing mark and space frequency components, the tracker circuit also delivering an internal time reference for the bit clock; and a transmitter for coupling the output of the oscillator to the power line for transmission of the mark and space frequency signals having a bandwidth less than ten Hertz on the power line".

Regarding claim 20: The power line distribution system comprising: "a transmitter coupled to the electric power distribution line comprising: an information signal generator providing an information signal; a first reference circuit for detecting a power frequency of an alternating current transmitted on the electric power distribution

line; and a modulator connected to the information signal generator for taking the information signal as an input for modulation of a carrier signal, the modulator being operably connected to the first reference circuit such that the carrier signal has a frequency derived from and numerically referenced to the detected power frequency and a bandwidth of less than ten Hertz; and a receiver coupled to the electric power distribution line and comprising: a second reference circuit for detecting the power frequency of the alternating current transmitted on the electric power distribution line and providing a reference signal indicative of the detected power frequency; and means for demodulating the carrier signal from the output carrier signal".

Regarding claim 21: "converting the data to a series of pulses; converting the pulses into a frequency division multiplexed signal having a carrier frequency which is numerically derived from the power line frequency and a bandwidth of less than ten Hertz; and coupling the frequency division multiplexed signal on the power line".

Regarding claim 31: "a power line frequency tracker coupled to receive an input signal representative of the power line frequency and generate output frequencies representative of the mark and space frequencies to which the receiver is tuned; a mixer circuit for mixing the sine and cosine of the pulse and mark frequencies generated by the power line frequency tracker and the data signal and producing a vector representing the frequency difference between the mark frequency and the data signal; a comparison circuit for comparing the vectors and creating a data strength signal; and a decoder circuit receiving the data stream and producing an output representing the data".

The closest prior art, Hunt (US 5,581,229) in view of Gorecki (US 4,556,866) and further in view of Propp et al. (US 4,815,106) disclose conventional power line communication systems, either singularly or in combination, fail to anticipate or render the above limitations obvious.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toan N. Pham whose telephone number is (571) 272-2967. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel J. Wu can be reached on (571) 272-2964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

September 16, 2005

TOAN N. PHAM
PRIMARY EXAMINER